

2-6 Special Functions

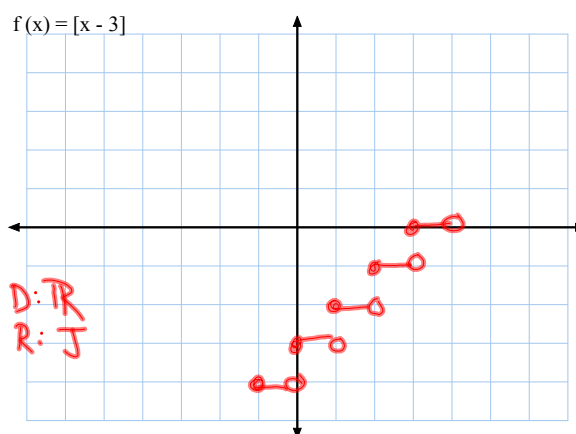
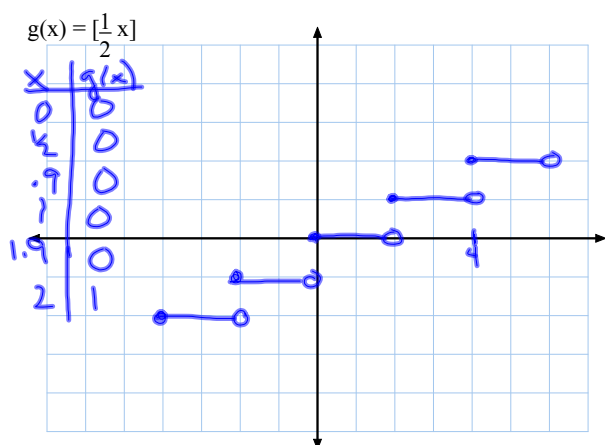
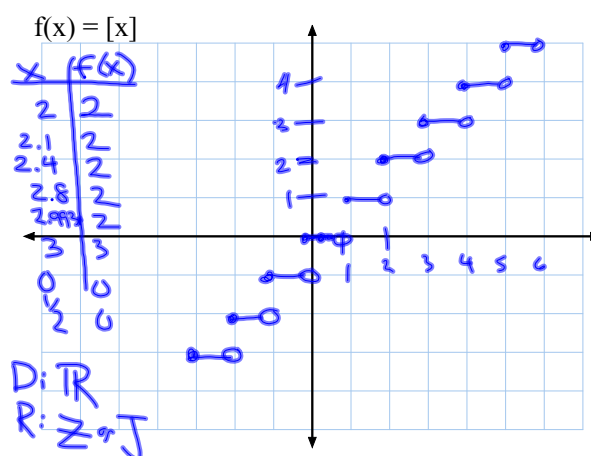
Step function

$$f(x) = [x]$$

$$f(x) = \lfloor x \rfloor$$

The greatest integer function--the greatest integer less than or equal to x .

"round down"



Piecewise Functions--a function that is written using two or more expressions

Def. Of absolute value:

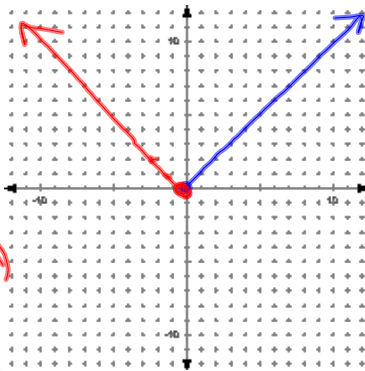
$$f(x) = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

① $y = x$ $\frac{x}{1} \div \frac{1}{1}$

② $y = -x$ $\frac{x}{-1} \div \frac{1}{1}$ (opposite)

Domain: \mathbb{R}

Range: $f(x) \geq 0$ $[0, +\infty)$



$$f(x) = \begin{cases} x & \text{if } x \geq 3 \\ 3 & \text{if } 0 < x < 3 \\ x+3 & \text{if } x \leq 0 \end{cases}$$

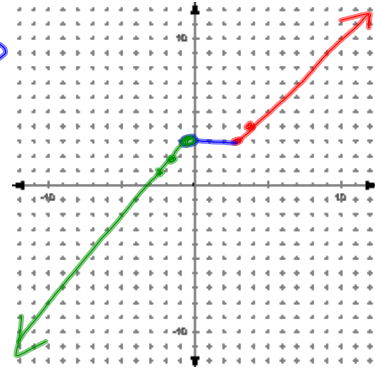
① $f(x) = x$ $\frac{x}{1} \div \frac{1}{1}$

② $f(x) = 3$ $\frac{x}{1} \div \frac{1}{1}$ (opposite)

③ $f(x) = x+3$ $\frac{x}{1} \div \frac{1}{1}$

Domain: \mathbb{R}

Range: \mathbb{R}

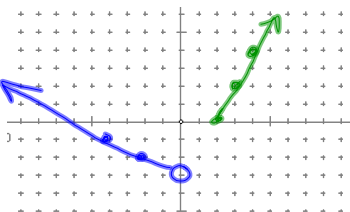


$$f(x) = \begin{cases} 2x-4 & \text{if } x \geq 2 \\ -\frac{1}{2}x-3 & \text{if } x < 2 \end{cases}$$

① $f(x) = 2x-4$ $\frac{x}{2} \div \frac{1}{2}$

② $f(x) = -\frac{1}{2}x-3$

$\frac{x}{-2} \div \frac{1}{2}$



Domain: $x < 2$ or $x \geq 2$

Range: $(-\infty, 0) \cup [2, +\infty)$

$f(x) > -3$

HW

p.94

22-24, 26-29, 38-42